**3GPP TSG-RAN WG2 Meeting #119bis-e R2-220XXXX**

Online,Oct 10th – Oct 19th, 2022

**Agenda Item:** 6.1.3

**Source:** CATT

**Title:** Summary of offline discussion: [AT119bis-e][602][MBS-R17] Other CP corrections (CATT)

**Document for:** Discussion and decision

# Introduction

This document aims at gathering companies’ views for the following offline discussion:

* [AT119bis-e][602][MBS-R17] Other CP corrections (CATT)

 Scope: Treat remaining issues from documents in 6.1.3.

 Outcome: Report (CATT) + CR(s) as needed:

* 38.300: Nokia
* 38.304: CATT
* 38.306/38.331 (capabilities): Mediatek

 Deadline: Report available: Tuesday 2022-10-18 1000 UTC, agreeable CR(s): EOM

# Discussion

## 304 corrections

### Changes in R2-2209548

Change 1 in R2-2209548

For change 1 in [1], it is about how to handle the co-existence between MBS frequency prioritization and the slice based reselection priorities. The related issue is supposed to be discussed in another offline (i.e. [AT119bis-e][005][NR17] Cell Reselection Frequency Prioritization).So this change is omitted in this discussion.

Change 2 in R2-2209548

For change 2 in [1], for the case UE was configured to receive broadcast on SCell in RRC\_CONNECTED before transiting to RRC\_IDLE or RRC\_INACTIVE state. When transiting to RRC\_IDLE or RRC\_INACTIVE state, UE is expected to camp on the correct frequency (e.g. frequency of the SCell) to continue the broadcast reception. Otherwise, the broadcast reception cannot be continued if UE selects a suitable cell by camping on another frequency that does not support the ongoing broadcast service. To achieve this, the straightforward way maybe by gNB implementation to redirect UE to the correct broadcast frequency upon leaving connected mode.

Therefore it propose to add a NOTE in section 5.2.6 of TS 38.304 for clarification as following,

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| --- |
| When returning to RRC\_IDLE state after UE moved to RRC\_CONNECTED state from *camped on any cell* state, UE shall attempt to camp on an acceptable cell according to *redirectedCarrierInfo*, if included in the *RRCRelease* message. If the UE cannot find an acceptable cell, the UE is allowed to camp on any acceptable cell of the indicated RAT. If the *RRCRelease* message does not contain *redirectedCarrierInfo* UE shall attempt to select an acceptable cell on an NR frequency. If no acceptable cell is found according to the above, the UE not in SNPN Access Mode shall continue to search for an acceptable cell of any PLMN in state *any cell selection*. If no acceptable cell is found according to the above, the UE in SNPN access mode shall continue to search for an acceptable cell of any SNPN in state *any cell selection*.NOTE y: It is up to NW implementation to redirect UE to the broadcast frequency upon leaving connected mode if UE was configured to receive broadcast on scell in RRC\_CONNECTED. |

**Question 1: Do companies agree** **to add a NOTE in section 5.2.6 of TS 38.304 as below?**

NOTE y: It is up to NW implementation to redirect UE to the broadcast frequency upon leaving connected mode if UE was configured to receive broadcast on scell in RRC\_CONNECTED.

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | See comments | The current proposed wording for the Note may restrict the network behaviour. A possible rewording can be:Note y: The UE may be redirected to the broadcast frequency upon leaving connected mode if it was configured to receive broadcast on Scell in RRC\_CONNECTED. |
| Xiaomi |  | No strong view. Since this is anyway up to the gNB implementation, it is probably ok to leave it as it is. |
| Ericsson | No | The NOTE is not clear, but we assume that it refers to the *redirectedCarrierInfo* in *RRCRelease*. But the network also redirects the UE via *SIB21* to the SCell frequency. We think that redirection via *redirectedCarrierInfo* and *SIB21* should not be mixed: the former is a NW request, while the latter is a UE preference. Perhaps the UE still wants to receive MBS broadcast when leaving connected, but the UE may also have another preference, i.e. we do not think that the NW should direct the UE to the MBS frequency in this case. When the UE is released then the UE is required to select a suitable cell via cell selection. But, in case the UE is interested to continue MBS broadcast reception, there is nothing preventing the UE implementation to select a suitable cell on the SCell frequency, i.e. there is no need for the NW to redirect the UE to the MBS frequency.  |
| vivo | No | We agree with the intention and believe the current spec could perfectly fulfill this goal (e.g. the RRC Release message with redirected info). But we don’t see the need to explicitly capture this in the stage-3 spec as we don’t miss anything.  |
| Samsung | No | We should not restrict the network behaviour. UE implementation can take care for camping on correct frequency/cell |
| Kyocera |  | No strong view, since it’s indeed up to gNB implementation. We just wonder if the redirection is really essential for the UE in IDLE/INACTIVE to receive MBS broadcast.  |
| Lenovo | No | It is up to network implenmentation.  |
| LGE | No | Even though NW doesn’t redirect UE to the broadcast frequency, the UE may re-select a proper cell by prioritizing the broadcast frequency.  |
| CATT | Yes(proponent) | The NOTE does not restrict the network behaviour but to clarify for the mentioned case as it say ” It is up to NW implementation”. |
| Sharp | No | As said by other companies, we do not need to restrict NW behaviour. |
| OPPO | No  |  |
| Nokia | No | UE is allowed to select cell providing MBS broadcast. Nothing prevents UE doing that. If we have this kind of NOTE it seems to imply that NW is not allowed to redirect to another non-MBS frequency even if there is a reason to do so. We should not do this. |
| Apple | No | It’s network implementation.  |
| ZTE | No | Just leave it to network choice and such note is not needed. |
| Intel | No | It is up to network implementation and no need for a note. |
| Huawei, HiSilicon | Not essential | Can keep the spec as it is, and leave it to NW implementation. |
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| **Summary:**16 companies have provided their views,* Yes:1 company.
* No:12 companies.
* No strong view:2 companies

Most of the companies do not support the change.Therefore, the proposal is given as below,**Proposal 1: Do not add NOTE( i.e., “It is up to NW implementation to redirect UE to the broadcast frequency upon leaving connected mode if UE was configured to receive broadcast on scell in RRC\_CONNECTED”) in section 5.2.6 of TS 38.304.** |

### Change in R2-2210069

In R2-2210069 [3], it is proposed to clarify that UEs expecting multicast session notification for multicast data arrival in RRC\_INACTIVE also need not monitor PEI.

The detailed change to section 5.2.4.1 of TS 38.304 is as the following,

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| 7.2.1 Paging Early Indication receptionThe UE may use Paging Early Indication (PEI) in RRC\_IDLE and RRC\_INACTIVE states in order to reduce power consumption. If PEI configuration is provided in system information, the UE in RRC\_IDLE or RRC\_INACTIVE state supporting PEI (except for the UEs expecting multicast session notification for activation in RRC\_IDLE/ RRC\_INACTIVE or for multicast data arrival in RRC\_INACTIVE) can monitor PEI using PEI parameters in system information according to the procedure described below. |

The rapporteur thinks the proposed change is reasonable as the group notification is used not only for session activation but also for data arrival, according to the description in TS 38.300 as below,

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| --- |
| 16.10.5.2 Configuration……gNBs supporting MBS use a group notification mechanism to notify the UEs in RRC IDLE/INACTIVE state when a multicast session has been activated by the CN or the gNB has multicast session data to deliver |

**Question 2: Do companies agree** **to change “the UEs expecting multicast session activation notification” to “the UEs expecting multicast session notification for activation in RRC\_IDLE/ RRC\_INACTIVE or for multicast data arrival in RRC\_INACTIVE” in section 7.2.1 of TS 38.304?**

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| **Company** | **Yes/No** | **Comments** |
| MediaTek | Yes |  |
| Xiaomi | Agree with the intention | We propose to make the sentence simpler as follows (i.e. without list all possible trigger conditions for the MBS group notification). The detailed trigger conditions for MBS group notification can be found from 38.300.The UE may use Paging Early Indication (PEI) in RRC\_IDLE and RRC\_INACTIVE states in order to reduce power consumption. If PEI configuration is provided in system information, the UE in RRC\_IDLE or RRC\_INACTIVE state supporting PEI (except for the UEs expecting MBS group notification) can monitor PEI using PEI parameters in system information according to the procedure described below. |
| Ericsson | See comments | Similar comments as Xiaomi, e.g. MBS session release is missing.In 38.300 it is already captured:- UE that expects MBS group notification shall ignore the PEI and shall monitor paging in its PO.We think the text in 38.304 can be removed, i.e. there is no need to capture the same requirement in two specifications. |
| vivo | No strong view | We think the current text in the spec is okay.  |
| Samsung | Yes | We think the existing spec text should be clarified. Suggestion from Xiomi is also fine to keep it simple, but proposed text was more clear.@Ericsson: leave requested by the network or MBS session release is not provided by group notification (also see comment on Q7) |
| Qualcomm | See comments | Xiaomi’s suggestion is simpler. |
| Kyocera | Yes | We agree with the rapporteur’s analysis. We’re also fine with Xiaomi’s wording.  |
| Lenovo | See comments | Xiaomi’s suggestion is better. |
| CATT | Yes | Agree that Xiaomi’s wording is simpler. |
| Sharp | Yes | Slightly prefer the wording from Xiaomi. |
| OPPO | Yes  | Prefer the wording from Xiaomi. |
| Nokia  | Yes | Looks fine  |
| Apple | Yes | Prefer Xiaomi’s wording.  |
| ZTE | Yes | how about "group notification" for even concise description. |
| Intel | Yes | Xiaomi’s wording looks fine to us. |
| Huawei, HiSilicon | Yes | Also think Xiao’s wording is simpler |

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| **Summary:**16 companies have provided their views,* Yes(including agree with intention but prefer other wordings): 11 companies.
* No strong view:1 1 company

Most of the companies support the change.and there are a number of companies prefer the wording provided by Xiaomi.Therefore, the proposal is given as below,**Proposal 2:** **Change “the UEs expecting multicast session activation notification” to “the UEs expecting MBS group notification” in section 7.2.1 of TS 38.304.** |

### Changes in R2-2210131

In R2-2210131 [4], several changes are proposed.

Change 1 in R2-2210131

For change 1 in R2-2210131 [4], it is a correction to format error, i.e., various commas missing after i.e. and e.g.. It is proposed to add it.

The rapporteur thinks these format changes can be accepted directly and the proposed changes can be included in the CR update later, so no need to discuss it.

Change 2 in R2-2210131

For change 2 in [4], a wording change is proposed, i.e. the wording “SIB20 is provided by the cell” is changed to “SIB1 scheduling information of the cell contains SIB20”. The detailed change to section 5.2.4.1 of TS 38.304 is as the following,

|  |
| --- |
| If the MBS broadcast capable UE is receiving or interested to receive an MBS broadcast service, the UE may consider cell reselection candidate frequencies at which it cannot receive the MBS broadcast service to be of the lowest priority during the MBS broadcast session as specified in TS 38.300 [2], as long as the SIB1 scheduling information of the cell contains SIB20 on the MBS frequency which the UE monitors and as long as the condition 2) above is fulfilled for the serving cell. |

The rapporteur thinks the change is reasonable as it is consistent with the previous agreement.

**Question 3: Do companies agree to change “SIB20 is provided by the cell” to “SIB1 scheduling information of the cell contains SIB20” in section 5.2.4.1 of TS 38.304?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | Yes |  |
| Xiaomi | Yes |  |
| Ericsson | Yes |  |
| vivo | Yes |  |
| Samsung | - | It does not seem essential change |
| Qualcomm | - | Agree with Samsung |
| Kyocera | Yes |  |
| Lenovo | Yes |  |
| LGE | No | ‘SIB20 is provided’ doesn’t mean ‘SIB20 is broadcast’. It means ‘SIB20 is supported’, so the change is not needed. |
| CATT | Yes |  |
| Sharp | Yes |  |
| OPPO | Yes  |  |
| Nokia | Yes |  |
| Apple | Yes |  |
| ZTE | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes | Fine to align the wording. |

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| **Summary:**17 companies have provided their views,* Yes: 14 companies.
* No(including actual No from in comments):3 company

Most of the companies support the changeTherefore, the proposal is given as below,**Proposal 3:** **Change “SIB20 is provided by the cell” to “SIB1 scheduling information of the cell contains SIB20” in section 5.2.4.1 of TS 38.304.** |

Change 3 in R2-2210131

For change 3 in [4], it proposes to compress the conditions for broadcast frequency prioritization. The detailed change to section 5.2.4.1 of TS 38.304 is as the following,

|  |
| --- |
| If the MBS broadcast capable UE is receiving or interested to receive an MBS broadcast service(s) and can only receive this MBS broadcast service(s) by camping on a frequency on which it is provided, the UE may consider that frequency to be the highest priority during the MBS broadcast session as specified in TS 38.300 [2] as long as the two following conditions are fulfilled:1) SIB1 scheduling information of the cell reselected by the UE due to frequency prioritization for MBS contains SIB20;2) Either:- One or more MBS FSAI(s) of that frequency is indicated in SIB21 of the serving cell and the same MBS FSAI(s) is also indicated for this MBS broadcast service in MBS User Service Description (USD) as specified in TS 26.346 [20], or- SIB21 is not provided in the serving cell or SIB21 does not provide the frequency mapping for the concerned service and that frequency is included in the USD of this service, or |

The rapporteur thinks the proposed change seems not essential. As in the current spec, the description is correct and it may be clearer to list different cases in separate sub bullets.

**Question 4: Do companies agree** **to compress the conditions for broadcast frequency prioritization as below?**

- SIB21 is not provided in the serving cell or SIB21 does not provide the frequency mapping for the concerned service and that frequency is included in the USD of this service, or

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | Agree with the rapporteur comments on this change |
| Xiaomi | No | Agree with the rapporteur |
| Ericsson | No | Same view as rapporteur. Furthermore we think that the use of “or” and “and” in the same sentence makes the sentence more difficult to read.  |
| vivo | No | We fail to figure out the motivation for this correction as the current text in the spec is clear and technically correct.  |
| Samsung | No | Not essential change |
| Qualcomm | No | Non-essential beautification CRs should be discouraged at this stage. The editorial changes such as missing commas after e.g. and i.e. makes sense but such can be directly provided to MCC (and MCC can bring Cat D CR if needed). |
| Kyocera | No | We agree with the rapporteur’s view.  |
| Lenovo | No | Not essential change. |
| LGE | No | Agree with the rapporteur |
| CATT | No |  |
| Sharp | No | Agree with the rapporteur. |
| OPPO | No  |  |
| Noka | Yes(proponent) | Only intention was to clarify – no strong need to have this one but in our view it makes text easier to read |
| Apple | No |  |
| ZTE | No | Agree with the rapporteur |
| Intel | No | Agree with rapporteur. The logical relationship between “and” and “or” is not clear in the proposed change. |
| Huawei, HiSilicon | No | Not essential. |

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| **Summary:**17 companies have provided their views,* Yes: 14 companies.
* No(including actual No from in comments):3 company

Most of the companies support the changeTherefore, the proposal is given as below,**Proposal 3:** **Change “SIB20 is provided by the cell” to “SIB1 scheduling information of the cell contains SIB20” in section 5.2.4.1 of TS 38.304.** |

### Changes in R2-2210683

In R2-2210683 [5], several changes are proposed.

Change 1 in R2-2210683

For change 1 in [5], it indicates that for cell reselection, MBS broadcast capable UE only allows to consider the frequency which providing MBS broadcast it is interested in as the highest priority when UE can only receive MBS broadcast via PTM as specified in TS 38.300.So it proposes to add "via PTM" after “MBS broadcast service” or “MBS broadcast service(s)” in section 5.2.4.1. The detailed change to section 5.2.4.1 of TS 38.304 is as the following,

|  |
| --- |
| If the MBS broadcast capable UE is receiving or interested to receive an MBS broadcast service(s) via PTM and can only receive this MBS broadcast service(s) via PTM by camping on a frequency on which it is provided, the UE may consider that frequency to be the highest priority during the MBS broadcast session as specified in TS 38.300 [2] as long as the two following conditions are fulfilled:….If the MBS broadcast capable UE is receiving or interested to receive an MBS broadcast service via PTM, the UE may consider cell reselection candidate frequencies on which it cannot receive the MBS broadcast service via PTM to be of the lowest priority during the MBS broadcast session as specified in TS 38.300 [2], |

The rapporteur thinks that it already clear that MBS broadcast services are only provided via PTM according to other RAN2 spec (e.g. 38.300).So it seems not necessary to add “via PTM” after “MBS broadcast service” or “MBS broadcast service(s)”.

**Question 5: Do companies agree to add “via PTM” after “MBS broadcast service” or “MBS broadcast service(s)” in section 5.2.4.1 of TS 38.304?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | Agree with the rapporteur comments on this change |
| Xiaomi | No | Agree with the rapporteur |
| Ericsson | No | Agree with the rapporteur |
| vivo | No | We prefer a general description in the Stage-2 spec (i.e. keep the spec as it was).  |
| Samsung | No | Existing text is already clear |
| Qualcomm | No | This is not essential. The editorial change of ‘at’ to ‘on’ makes sense. If we are going to have a 38.304 CR, this can be included there, otherwise this can be directly provided to MCC (and MCC can bring Cat D CR if needed). |
| Kyocera | No | We agree with the rapporteur’s view.  |
| Lenovo | No |  |
| LGE | No | Agree with the rapporteur |
| CATT | No |  |
| Sharp | No | Agree with the rapporteur. |
| OPPO | No  |  |
| Nokia | No | We agree with rapporteur |
| Apple | No |  |
| ZTE |  | Although we still think it is necessary to align the descriptions for broadcast in 38304 and 38300, we are also ok to follow the majority view.  |
| Intel | No | Agree with rapporteur. |
| Huawei, HiSilicon | No |  |

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| **Summary:**17 companies have provided their views,* No: 16 companies.
* Follow the majority view:1 company

There is consecus to not make the change.Therefore, the proposal is given as below,**Proposal 4: Do not add “via PTM” after “MBS broadcast service” or “MBS broadcast service(s)” in section 5.2.4.1 of TS 38.304.** |

Change 2 in R2-2210683

For change 2 in [5], it is a correction to the grammar error in section 5.2.4.1 of TS 38.304. It proposes to change the preposition “at” to “on” to be consistent across spec when describing on which frequency the MBS broadcast service is received in section 5.2.4.1

The rapporteur thinks the grammar error corrections can be accepted directly and the proposed changes can be included in the CR update later, so no need to discuss it.

Change 3 in R2-2210683

For change 3 in [5], a wording change to “MBS frequency” is proposed. i.e. to change the “MBS frequency” to “frequency” in section 5.2.4.1 of TS 38.304.

The rapporteur thinks using the term “MBS frequency” does not cause any misunderstanding and it is widely used in RAN2 specs (e.g. 38.300, 38.331).So it seems no need to change it.

**Question 6: Do companies agree** **to change “MBS frequency” to “frequency” in section 5.2.4.1 of TS 38.304?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | Agree with the rapporteur comments on this change |
| Xiaomi | No | Agree with the rapporteur |
| Ericsson | No | Agree with rapporteur. In case companies want a change, suggest to say “frequency on which the UE can receive MBS”. But we think no change is need. |
| vivo | No | The current wording in the spec is clearer.  |
| Samsung | No | Agree with the rapporteur |
| Kyocera | No | We agree with the rapporteur’s view.  |
| Lenovo | No |  |
| LGE | No | Agree with the rapporteur |
| CATT | No |  |
| Sharp | No | Agree with the rapporteur. |
| OPPO | No  |  |
| Nokia | No |  |
| Apple | No |  |
| ZTE |  | OK to follow the majority view |
| Intel | No | Agree with rapporteur. |
| Huawei, HiSilicon | No |  |

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| --- |
| **Summary:**16 companies have provided their views,* No: 15 companies.
* Follow the majority view:1 company

There is consecus to not make the change.Therefore, the proposal is given as below,**Proposal 5: Do not** **change “MBS frequency” to “frequency” in section 5.2.4.1 of TS 38.304.** |

Change 4 in R2-2210683

For change 4 in [5], it proposes to change "Broadcast MRB" to "broadcast MRB" to be consistent with the description of TS 38.331 in section 6.2.

The rapporteur thinks the proposed change is a minor error and can be accepted directly. The proposed changes can be included in the CR update later. So there is no need to discuss it.

Change 5 in R2-2210683

For change 5 in [5], it indicates that the purpose of paging for multicast is not only to notify the session activation, but also to notify UE about the session release. So it proposes to change "session activation" to "session state change" when describing the paging for multicast, the purpose of paging is to notify the multicast session state change in section 6.2. The detailed change to TS 38.304 is as the following,

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| --- |
| 6.2 Reception of MBSA UE receiving or interested to receive MBS broadcast services shall apply the MCCH information acquisition procedure as specified in TS 38.331 [3] to receive the MCCH information. A UE interested to receive MBS broadcast services identifies if a service that it is interested to receive is started or ongoing by receiving the MCCH information, and then receives a MTCH(s) configured using the broadcast MRB establishment procedure as specified in TS 38.331 [3] and using the DL-SCH reception and MBS broadcast DRX procedure as specified in TS 38.321 [19].UEs which have joined a multicast session(s) and are in RRC\_IDLE/RRC\_INACTIVE state shall apply the reception of the paging message procedure as specified in TS 38.331 [3] to receive notification of the multicast session state change as specified in TS 23.247 [21]. |

The rapporteur understands there are no RAN2 agreements in R17 MBS to use group paging for notification of session release.

In RAN2#114e, it is agreed to use PCCH for multicast activation notification,

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| * Use PCCH for Multicast activation notification (also for MBS supporting nodes).
 |

And also in section 16.10.5.2 of 38.300, it states that group notification is used to notify the UEs in RRC IDLE/INACTIVE state when a multicast session has been activated by the CN or the gNB has multicast session data to deliver, as below,

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| --- |
| When there is (temporarily) no data to be sent to the UEs for a multicast session, the gNB may move the UE to RRC IDLE/INACTIVE state. gNBs supporting MBS use a group notification mechanism to notify the UEs in RRC IDLE/INACTIVE state when a multicast session has been activated by the CN or the gNB has multicast session data to deliver. |

So the proposed change seems not correct.

**Question 7: Do companies agree** **to change “receive notification of multicast session activation” to “receive notification of multicast session state change” in section 6.2 of TS 38.304?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | Agree with the rapporteur comments on this change.This was discussed before when the notification was specified.  |
| Xiaomi | No | Agree with the rapporteur |
| Ericsson | See comment | ZTE has a point that group paging is not only used for session activation, but also for leave requested by the network or MBS session release. This will also clarified in 38.300 (see [R2-2209866](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_119bis-e/Docs/R2-2209866.zip)):When there is temporarily no data to be sent to the UEs for a multicast session that is active, the gNB may move the UE to RRC\_INACTIVE state. When an MBS multicast session is deactivated, the gNB may move the UE to RRC\_IDLE or RRC\_INACTIVE state. gNBs supporting MBS use a group notification mechanism to notify the UEs in RRC\_IDLE or RRC\_INACTIVE state when a multicast session has been activated by the CN. gNBs supporting MBS use a group notification mechanism to notify the UEs in RRC\_INACTIVE state when the session is already activated and the gNB has multicast session data to deliver. Upon reception of the group notification, the UEs reconnect to the network or resume the connection and transition to RRC\_CONNECTED state. The group notification is addressed with P-RNTI on PDCCH, and the paging channels are monitored by the UE as described in clause 9.2.5. Paging message for group notification contains MBS session ID which is utilized to page all UEs in RRC\_IDLE and RRC\_INACTIVE states that joined the associated MBS multicast session, i.e., UEs are not paged individually. The UE stops monitoring for group notifications related to a specific multicast session, i.e., stops checking for the MBS session ID in the Paging message, when the UE enters RRC\_CONNECTED state. The UE does not monitor for group notifications for these cases, i.e., once this UE leaves this multicast session or the network requests the UE to leave, or the network releases the multicast session.This in inline with the SA2 requirements specified in 23.247 (see section 7.2.5.2 *MBS session activation procedure* and section 7.2.2.3 *Multicast session leave requested by the network or MBS session release*))The UE monitors group paging after it has joined a multicast session, and until it leaves or is requested to leave or the session is released.To align with 38.300 we propose the following change:when the UE expects MBS group notification as specified in clause 16.10.5.2 in TS 38.300 [2].Eri2: * We agree that group paging is not used in case of “leave requested by network”, sorry for the confusion.
* But the NW can use group paging in case of session release (e.g. when the NW wants to notify the UEs immediately). The NW also has to option to wait and notify the UE when it is in RRC\_CONNECTED. Section 7.2.2.3:

*2. For UEs without activated UP, the SMF may perform the same procedure as defined in step 3-7 in clause 7.2.5.2.* *Alternatively, for UEs without activated UP, the SMF does not trigger message to the AMF, instead the SMF marks that the UE is to be informed of the MBS Session release. In this case, the SMF initiates PDU Session Modification to inform the UE of the MBS Session release at next UP activation of the associated PDU Session, if needed.** When the UE receives a group notification it does not know the reason, there is no cause value in the paging message for this, i.e. it only triggers the UE to go to connected mode, see 38.331.
* We think that the 23.247 (SA2) is the leading specification about group paging, and perhaps the 38.413 (RAN3) needs to be updated.
* The UE monitors group notifications once it has joined a session. And the UE stops monitoring when the session is released, UE decides to leave, or the UE is requested to leave. Perhaps it is better to avoid “UE expects” but use the same wording as in 38.331:
* While the UE has joined an MBS session the UE monitors group notification.

For the cases RAN2 decides that a clarification is needed in 38.300. |
| vivo | No | The proposed wording would mix up with activation and release operation. Without a doubt, group paging is not used for session release. |
| Samsung | No | Agree with Rapporteur that change seems not correct. Further, there is no term like “multicast session state change” in TS 23.247 v17.4.0. Rather, sec 5.3.2.6 and sec 5.3.2.7 in TS 23.247 use “multicast session activation” term.Group paging is not used for multicast session leave requested by the network or MBS session release in sec 7.2.2.3. Also. refer to 38.413 v17.2.0 sec 9.2.4.2 for message structure of Multicast Group paging 9.2.4.2 MULTICAST GROUP PAGINGThis message is sent by the AMF and is used to notify involved UEs about the activation of a multicast MBS session |
| Qualcomm | - | To avoid multiple current and future changes, it seems reasonable to adopt Ericsson’s proposal above to refer to 38.300 instead of listing all the conditions in 38.304, which is also similar to suggestion in Q2 above. |
| Kyocera | No | We agree with the rapporteur’s analysis.  |
| Lenovo | No | group paging is not used for session release. |
| LGE | No | Agree with the rapporteur |
| CATT | No |  |
| Sharp | No | Agree with the rapporteur. |
| OPPO | No  | Only for MBS activstion case in R17. |
| Nokia | No | For deactivation there is no such thing as notifying the UEs with paging. For the release of a session (or UE leave), group paging can be used. Rather than the proposed wording, we can simply say “… activation and release as specified in TS 23.247”. |
| Apple | No |  |
| ZTE | Yes | Ericsson suggestion also makes sense. |
| Intel | No | Agree with rapporteur. |
| Huawei, HiSilicon | No | The focus/point of this section is only about activiation and paging (not only group paging actually), i.e. the UE needs to monitor paging for multicast activation. Nothing else. The change makes the sentence deviated from the point. Of course, the network may send paging for other purposes. |

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| **Summary:**17 companies have provided their views,* No: 14 companies.
* Yes(including companies prefer other wording):3 company

Most of the companies do not support the change.However,the rapporteur notice that the data arrival case(mentioned in 38.300) is not covered in the current spec,so it seems make sense to adopt the change proposed by Ericsson.Therefore, the proposal is given as below,**Proposal 6:** **Change “to receive notification of multicast session activation as specified in TS 23.247 [21]” to “when the UE expects MBS group notification as specified in clause 16.10.5.2 in TS 38.300 [2]” in section 6.2 of TS 38.304.** |

## Capabilities corrections

### Changes in R2-2209655

In [2], two changes to 38.306 are proposed.

Change 1 in R2-2209655

In change 1 of [2], it indicates that for the below agreement the corresponding description in 38.306 may leads to a misunderstanding that there is at most two split-MRBs configured for multicast, which is not correct and not aligned with the agreements.

|  |
| --- |
| * Reuse the current defined max RB (i.e. 16 RB per UE). Additional note shall be added to TS 38.306 to clarify the max RB is a total number for MRBs and DRBs, and the total number of RBs for split-MRB is considered as two.
 |

It proposes to clarify that each split-MRB is considered as two RBs for the determination of the maximum number of RBs supported by the UE.

The detailed change to section 8 of TS 38.306 is as the following,

|  |
| --- |
| NOTE 1: For one MAC entity, the maximum number of DRBs configured with PDCP duplication and with RLC entity(ies) associated with this MAC entity is 8.NOTE 2: In case of CGI reporting, the limit regarding the cells configured includes the cell for which the UE is requested to report CGI i.e. the amount of neighbour cells that can be included is at most (# minCellperMeasObjectRAT - 1), where RAT represents NR and EUTRA.NOTE 3: This requirement is applicable in NR SA, NR-DC and NE-DC.NOTE 4: The value of parameter #DRBs defines the total number of multicast MRBs and DRBs, and each split-MRB is counted as two RBs. |

The rapporteur understands the original wording indeed has space for misunderstanding and the proposed change seems clearer.

**Question 8: Do companies agree** **to change NOTE 4 in section 8 of TS 38.306 as below?**

NOTE 4: The value of parameter #DRBs defines the total number of multicast MRBs and DRBs, and each split-MRB is counted as two RBs.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | If we follow the proposal, it means even though the UE only receives one leg of the split MRB, it will be still counted as two RBs, which may be not the intention of the spec following RAN2 previous agreement.  |
| Xiaomi | Yes | We think that the proposed change is aligned with the RAN2 agreement that one split MRB is counted as two RBs. |
| Ericsson | Yes | @MDTK: this is about capability/support, not about use.  |
| vivo | Yes | The proposed text is clearer.  |
| Samsung | Yes |  |
| Qualcomm | Yes |  |
| Kyocera | Yes |  |
| Lenovo | Yes |  |
| LGE | Yes | As pointed out in the rapporteur’s summary, the current text is understood as a UE can be configured with two split-MRBs at the maximum. It is not aligned with the agreement. The change seems to reflect the agreement correctly. |
| CATT | Yes |  |
| Sharp | Yes |  |
| OPPO | Yes | The proposed change is more clear. |
| Nokia | Yes |  |
| Apple | Yes |  |
| ZTE | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |

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| **Summary:**17 companies have provided their views,* Yes: 16 companies.
* No:1 company

Most of the companies support the changeTherefore, the proposal is given as below,**Proposal 7: Change NOTE 4 in section 8 of TS 38.306 to “NOTE 4: The value of parameter #DRBs defines the total number of multicast MRBs and DRBs, and each split-MRB is counted as two RBs”.** |

Change 2 in R2-2209655

For change 2 in [2], it indicates that a previous RAN2#116bis-e agreement was not captured in 38.306.

|  |
| --- |
| * MBS DRX with long DRX cycle is mandatory for multicast capable UEs.
 |

So it proposes to add in 38.306 that a UE supporting multicast shall indicate support of long DRX cycle capability.

The detailed change to section 4.2.7.5 of TS 38.306 is as the following,

| ***dynamicMulticastPCell-r17***Indicates whether the UE supports dynamic scheduling for multicast for PCell comprised of the following functional components:- Supports group-common PDCCH/PDSCH with CRC scrambled by G-RNTI for PCell;- Supports CFR configuration for multicast;- Supports CORESET and common search space configuration for multicast;- Supports DCI format 4\_1 with CRC scrambled with G-RNTI for multicast;- Supports inter-slot TDM between unicast PDSCH and group-common PDSCH in different slots;- Supports {2, 4, 8} times semi-static slot-level repetition for group-common PDSCH for multicast.A UE indicating support of this feature shall support *longDRX-Cycle*. | FS | No | N/A | N/A |
| --- | --- | --- | --- | --- |

**Question 9: Do companies agree to add “A UE indicating support of this feature shall support *longDRX-Cycle*.” in the definition for parameter *dynamicMulticastPCell-r17* in section 4.2.7.5 of TS 38.306?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | Yes, with comments | The intention of the proposal is correct. Meanwhile the wording should be improved as following: A UE supporting this feature shall also indicate the support of *longDRX-Cycle*. |
| Xiaomi | Yes |  |
| Ericsson | No | Support of LongDRX-Cycle is mandatory for any UE, not specifically for a UE supporting MBS broadcast. LongDRX-Cycle is mandatory with IOT bit:In the table of UE capability parameter in subsequent clauses, "Yes" in the column by "M" indicates the associated feature is mandatory and "No" indicates the associated feature is optional.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Definitions for parameters | Per | M | FDD-TDD DIFF | FR1-FR2 DIFF |
| ***longDRX-Cycle***Indicates whether UE supports long DRX cycle as specified in TS 38.321 [8]. | UE | Yes | Yes | No |

If we would start to clarify this for MBS broadcast, then we would need to clarify this explicitly for other features as well.  |
| vivo | No | Same view as Ericsson. In this sense, it is redundant to capture this description.  |
| Samsung | No | Agree with Ericsson |
| Qualcomm | No | While the intent is correct, no changes needed. Agree with Ericsson |
| Kyocera | Yes |  |
| Lenovo | No | Same view with Ericsson |
| LGE | Yes |  |
| CATT | No | Agree with Ericsson |
| Sharp | No | Agree with Ericsson. |
| OPPO | No | Agree with Ericsson. |
| Nokia | No | Same with with Ericsson |
| Apple | No | Agree with Ericsson. |
| ZTE | No | Same with with Ericsson |
| Intel | No | Agree with Ericsson. |
| Huawei, HiSilicon | Yes | For unicast, Long DRX is manatory with capability. We assume that RAN2 agreement for Multicast means Long DRX should be conditional mandatory for multicast, i.e. if the UE supports Multicast, it should support long DRX without capability.Otherwise, we need to see if the legacy Long DRX capability bit (for unicast) should be applicable to Multicast DRX. |

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| **Summary:**17 companies have provided their views,* Yes(including Yes with comment): 5 companies.
* No:12 company

There is a majority view to not make the change. However,according to the discussion in the email thread,.Therefore, the proposal is given as below,**Proposal 8: Add “A UE supporting this feature shall also support drx-LongCycle-PTM.” in the definition for parameter dynamicMulticastPCell-r17 in section 4.2.7.5 of TS 38.306.** |

### Change in R2-2209909

In R2-2209909 [7], it indicates that the components of FG 33-1 (as copied below) are not incorporated into Broadcast capability specified in TS 38.306 clause 5.10. It is proposed to capture those components for completeness.

| Definitions for feature |
| --- |
| **Broadcast reception**It is optional for UE to support broadcast reception as specified in TS 38.331 [9]. A UE that supports the feature shall also support:- 4 broadcast MRBs as the minimum number;- PDCP 12 bits SN;- ROHC with profiles 0x0000, 0x0001 and 0x0002;- 8 ROHC context sessions;- RLC UM with 6 bits SN;- RLC UM with 12 bits SN;- DRX with long DRX cycle;- Group-common PDCCH/PDSCH with CRC scrambled by MCCH-RNTI;- Group-common PDCCH/PDSCH with CRC scrambled by G-RNTI;- CFR configuration for broadcast;- CORESET and common search space for broadcast; - DCI format 4\_0 with CRC scrambled with G-RNTI/MCCH-RNTI for broadcast;- Inter-slot TDM between unicast PDSCH and group-common PDSCH in different slots;- MCCH change notification indication via DCI;- Higher layer configured slot-level repetition up to 8 for MTCH. |

**Question 10: Do companies agree to capture RAN1 components of FG 33-1 in section 5.10 of TS 38.306?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes |  |
| vivo | Yes | We suggest putting the RAN1 characteristics in front of the RAN2 features.  |
| Samsung | Yes |  |
| Qualcomm | Yes |  |
| Kyocera | Yes |  |
| MediaTek | Yes |  |
| Lenovo | Yes |  |
| LGE | Yes |  |
| CATT | Yes |  |
| Sharp | Yes |  |
| OPPO | Yes  |  |
| Apple | Yes |  |
| ZTE | Yes |  |
| Intel | Yes (Proponent) |  |
| Huawei, HiSilicon | Yes |  |

|  |
| --- |
| **Summary:**15 companies have provided their views,* Yes: 15 companies.

All companies support the changeTherefore, the proposal is given as below,**Proposal 9:** **Capture RAN1 components of FG 33-1 in section 5.10 of TS 38.306.** |

## 300 correction

### Change in R2-2210711

In R2-2210711 [6], it proposes to clarify in 38.300 that the UE uses the start/stop times in the USD to determine when to start/stop monitor the MCCH. The detailed change to TS 38.300 is as the following,

|  |
| --- |
| 16.10.6.2 ConfigurationMBS broadcast can be received by UEs in RRC\_IDLE, RRC\_INACTIVE and RRC\_CONNECTED state. A UE can receive the MBS configuration for broadcast session (e.g., parameters needed for MTCH reception) via MCCH in RRC\_IDLE, RRC\_INACTIVE and RRC\_CONNECTED state. The parameters needed for the reception of MCCH are provided via System Information.The following principles govern the MCCH structure:- MCCH provides the list of all broadcast services with ongoing sessions transmitted on MTCH(s) and the associated information for broadcast session includes MBS session ID, associated G-RNTI scheduling information and information about neighbouring cells providing certain service on MTCH(s). MCCH content is transmitted within periodically occurring time domain windows, referred to as MCCH transmission window defined by MCCH repetition period, MCCH window duration and radio frame/slot offset;- MCCH uses a modification period and MCCH contents are only allowed to be modified at each modification period boundary; A notification mechanism is used to announce the change of MCCH contents due to broadcast session start, modification or stop and due to neighbouring cell information modification;NOTE: The UE uses the start and stop times in the USD to determine when to start monitoring the MCCH for the session the UE is interested in. |

According to current spec, UE starts to monitor MCCH DCI when UE is interested in a broadcast service. The function can work correctly. The rapporteur understands the proposed change is an optimization for UE power consumption.

**Question 11: Do companies agree** **to add a NOTE in section 16.10.6.2 of TS 38.300 as below?**

NOTE: The UE uses the start and stop times in the USD to determine when to start monitoring the MCCH for the session the UE is interested in.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | Too late for Rel-17 to adopt this optimization |
| Xiaomi | No | We think that using “the start and stop times in the USD” is just one input for the UE implementation to determine “when to start monitoring the MCCH”. As the UE implementation could also consider many other aspects, e.g. power consumption, we would suggest not to list them.  |
| Ericsson | Yes (proponent) | This is not an optimization, i.e. any UE implementation needs to use the start/stop times in the USD to determine when the to prioritize the MBS frequency. In 38.304 it is specified that the UE may prioritize the MBS frequency when the session is ongoing: If the MBS broadcast capable UE is receiving or interested to receive an MBS broadcast service(s) and can only receive this MBS broadcast service(s) by camping on a frequency on which it is provided, the UE may consider that frequency to be the highest priority during the MBS broadcast session as specified in TS 38.300 [2] as long as the two following conditions are fulfilled:The UE should not prioritize the MBS frequency and monitor the MCCH for session start when e.g. the session starts tomorrow.  |
| vivo | No | We don’t see the need to explicitly capture the UE implementation details in the Stage-2 spec.  |
| Samsung | No | We think it is not proper to control MCCH monitoring based on USD.* UE does not monitor MCCH continuously as it rather monitors for MCCH change notification. MCCH is read once and is updated based on change notification. Therefore, there is no additional cost.
* There may be latency in session setup if UE only starts monitoring MCCH based on USD start time.
* There may be difference in USD start time (which is more of a program guide) and actual transmission time (or no transmission) of session through MCCH. This is already notified by a session start in the MCCH change notification.
* USD information delivery mechanisms may differ. It may not be refreshed when UE resides in IDLE/INACTIVE.
 |
| Qualcomm | No | When UE gets interested in a broadcast service is up to UE implementation. As others have explained, while start/stop time in USD could be one input for the UE to determine whether it is interested, there is no need to explicitly list it. Even if we were to have such a NOTE, it should be “The UE may use..” |
| Kyocera | Yes | We think the behaviour is one of main usages of USD from the AS point of view (which is well known from LTE eMBMS), and we don’t see the Note is harmful. So, we slightly prefer this Note for clarification.  |
| Lenovo | No | UE implenmentation issue? |
| LGE | No | Agree with Xiaomi.  |
| CATT | No strong view |  |
| Sharp | No | Agree with the rapporteur it is an optimization. |
| OPPO | No  | In my understanding, it is UE implementation issue. |
| Nokia | Yes | But UE may use this information if it sees it beneficial. Maybe wording of NOTE could be changed a bit to indicate this behaviour is allowed by the UE (NOTE there is bit similar note added about area information in the email discussion 601) |
| Apple | No | It’s the UE implementation.  |
| ZTE | No | We think it is up to UE implementation on when to start monitoring MCCH, there is no need to restrict it. |
| Intel | No | We agree with rapporteur that this is an optimization. In addition, start/stop time (as part of sessionSchedule) might not be always available, as from the schema in TS 26.517, copied below:<xs:element name="sessionSchedule" type="reoccurenceStartStopType" minOccurs="0" maxOccurs="unbounded"/> |
| Huawei, HiSilicon | Yes/No | Tend to agree with Xiaomi/Nokia and some others that the start and stop times is only one possibility to determine to start monitoring MCCH, but not the only way. Therefore, if it needs to be captured, it should be revised.At the same time, we also think the change is not essential. |

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| **Summary:**17 companies have provided their views,* Yes: 12 companies.
* No:3 company
* No strong view(including Yes/No): 2 companies

There is a majority view to not make the change. Therefore, the proposal is given as below,**Proposal 10:** **Do not add NOTE(i.e.,** “**The UE uses the start and stop times in the USD to determine when to start monitoring the MCCH for the session the UE is interested in.”)** **in section 16.10.6.2 of TS 38.300.** |

# Conclusion

Based on the discussion, the following is proposed:

**Proposal 1: Do not add NOTE( i.e., “It is up to NW implementation to redirect UE to the broadcast frequency upon leaving connected mode if UE was configured to receive broadcast on scell in RRC\_CONNECTED”) in section 5.2.6 of TS 38.304.**

**Proposal 2:** **Change “the UEs expecting multicast session activation notification” to “the UEs expecting MBS group notification” in section 7.2.1 of TS 38.304.**

**Proposal 3:** **Change “SIB20 is provided by the cell” to “SIB1 scheduling information of the cell contains SIB20” in section 5.2.4.1 of TS 38.304.**

**Proposal 4: Do not add “via PTM” after “MBS broadcast service” or “MBS broadcast service(s)” in section 5.2.4.1 of TS 38.304.**

**Proposal 5: Do not** **change “MBS frequency” to “frequency” in section 5.2.4.1 of TS 38.304.**

**Proposal 6:** **Change “to receive notification of multicast session activation as specified in TS 23.247 [21]” to “when the UE expects MBS group notification as specified in clause 16.10.5.2 in TS 38.300 [2]” in section 6.2 of TS 38.304.**

**Proposal 7: Change NOTE 4 in section 8 of TS 38.306 to “NOTE 4: The value of parameter #DRBs defines the total number of multicast MRBs and DRBs, and each split-MRB is counted as two RBs”.**

**Proposal 8: Add “A UE supporting this feature shall also support drx-LongCycle-PTM.” in the definition for parameter dynamicMulticastPCell-r17 in section 4.2.7.5 of TS 38.306.**

**Proposal 9:** **Capture RAN1 components of FG 33-1 in section 5.10 of TS 38.306.**

**Proposal 10:** **Do not add NOTE(i.e.,** “**The UE uses the start and stop times in the USD to determine when to start monitoring the MCCH for the session the UE is interested in.”)** **in section 16.10.6.2 of TS 38.300.**

# References

[1] R2-2209548 Corrections to TS 38.304 for MBS CATT, CBN CR Rel-17 38.304 17.2.0 0284 - F NR\_MBS-Core Late

[2] R2-2209655 Correction on UE capability for MBS Huawei, CBN, HiSilicon CR Rel-17 38.306 17.2.0 0809 - F NR\_MBS-Core

[3] R2-2210069 Correction to PEI monitoring for group notification Samsung CR Rel-17 38.304 17.2.0 0285 - F NR\_MBS-Core

[4] R2-2210131 Various small corrections to 38.304 Nokia, Nokia Shanghai Bell CR Rel-17 38.331 17.2.0 3525 - F NR\_MBS-Core

[5] R2-2210683 CR to TS 38.304 on NR MBS ZTE, Sanechips CR Rel-17 38.304 17.2.0 0294 - F NR\_MBS-Core

[6] R2-2210711 When to monitor the MCCH on the MBS frequency Ericsson, Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_MBS-Core

[7] R2-2209909 Remaining MBS UE capability open issues Intel Corporation discussion Rel-17 NR\_MBS-Core